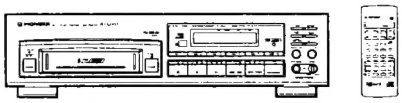
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
RRV1072

MULTI-PLAY COMPACT DISC PLAYER

PD-M703

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	PD-M703		
KUXJ	○	AC120V	
KCXJ	○	AC120V	
WEMXJ	○	AC220 – 240V	
WBXJ	○	AC220 – 240V	

● **For KCXJ, WEMXJ and WBXJ types, refer to page 40.**

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

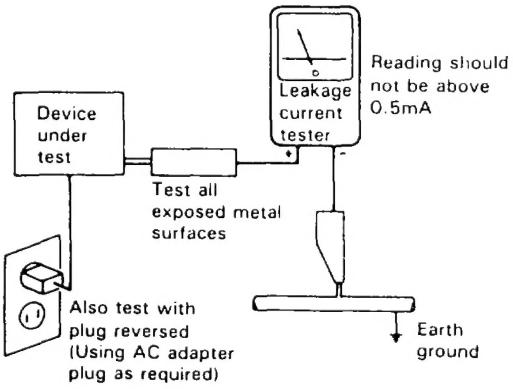
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

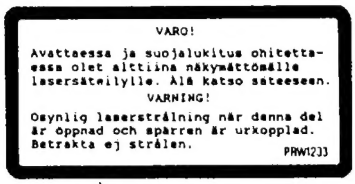
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

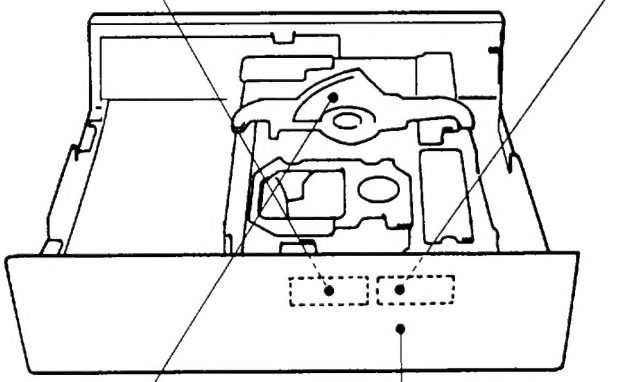
LABEL CHECK (MULTI MAGAZINE type)

WEMXJ type

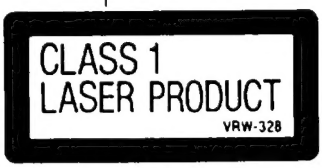


WEMXJ type

WBXJ type



WEMXJ and WBXJ types



WEMXJ and WBXJ types

Additional Laser Caution

1. Laser Interlock Mechanism
   The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level) (clamped state).
   Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.
   The interlock also does not operate in the test mode *. Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the preamplifier board loaded on pick up assembly are connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam. '92M1

* Refer to page 28.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:

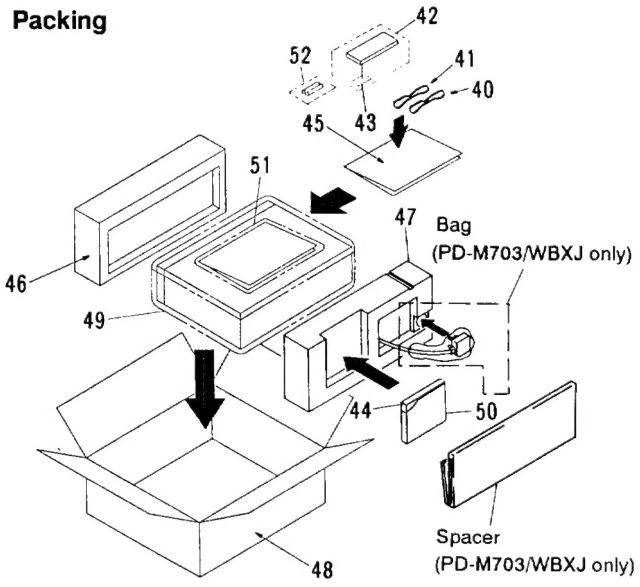
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

2.1 EXTERIOR AND PACKING

Parts List

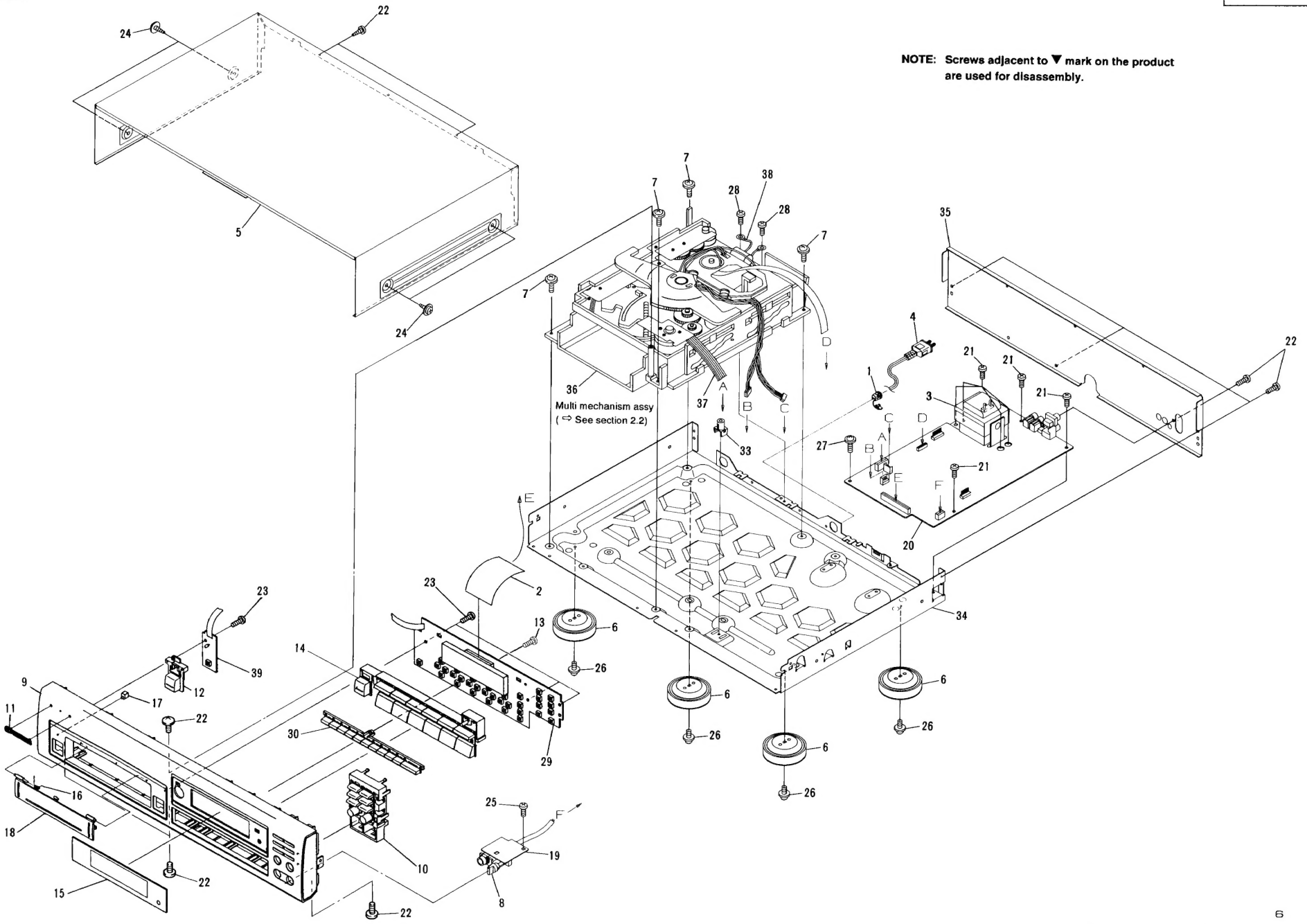
Mark	No.	Description	Part No.
⚠	1	Strain relief	CM – 22C
	2	32P F.F.C/30V	PDD1125
⚠	3	Power transformer	PTT1237
⚠	4	Power cord with plug	PDG1002
	5	Bonnet	PYY1149
	6	Insulator	PNW1912
	7	Screw	IBZ30P080FCC
	8	Knob (Headphone)	PAC1707
	9	Function panel	PNW2453
	10	Mode button	PAC1709
	11	Name plate	PAM1608
	12	Power button	PAC1719
	13	Screw	BBZ26P120FZK
	14	Function button	PAC1717
	15	Display window	PAM1641
	16	Spring (Door)	PBH1022
	17	LED lens	PNW2019
	18	Door BK	PNW2264
NSP	19	Headphone board assy	PWZ2750
⚠	20	Mother board assy	PWM1845
	21	Screw	BBZ30P060FMC
	22	Screw	BBZ30P080FZK
	23	Screw	PPZ30P120FMC
	24	Screw	FBT40P080FZK
	25	Screw	IBZ30P060FCC
	26	Screw	IBZ30P100FCC
	27	Screw	IBZ30P180FMC
	28	Screw	PDZ30P050FMC
	29	Function board assy	PWZ2745
	30	Ten key	PAC1735
	31	65 label	ORW1069
	32	Binder	Z09 – 056
NSP	33	PCB mould	AMR1525
NSP	34	Under base	PNA1751
	35	Rear base	PNA2118
NSP	36	Multi mechanism assy	PXA1532
NSP	37	Flat cable (6P)	D20PYY0615E
	38	Earth lead unit	XDF – 502
NSP	39	Switch board assembly	PWZ2748
	40	Connection cord with mini plug (for SR cord)	PDE – 319
	41	Connection cord with pin plug (for Audio)	PDE1109
	42	Remote control unit	PWW1090
	43	Battery cover	PZN1012
	44	Magazine assembly	PXA1504
	45	Operating instructions (English)	PRB1209
	46	Styrol protector (F)	PHA1228
	47	Styrol protector (R)	PHA1229
	48	CD packing case	PHG2033
	49	Mirror mat sheet	Z23 – 007
	50	PP case	PYY1169
	51	Bag	Z21 – 038
NSP	52	Dry cell battery (R03, AAA)	VEM – 022

Packing

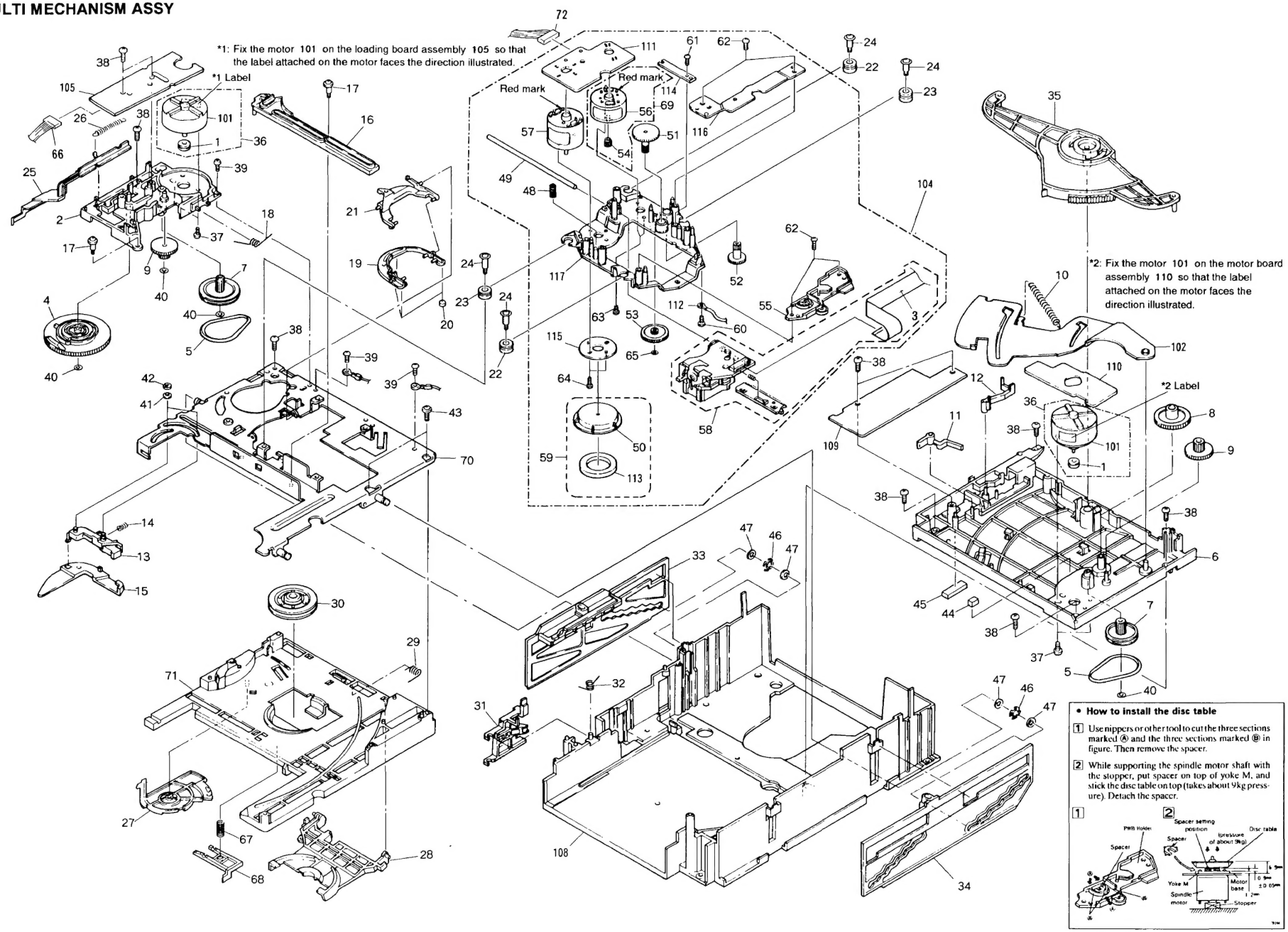


Exterior

NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.



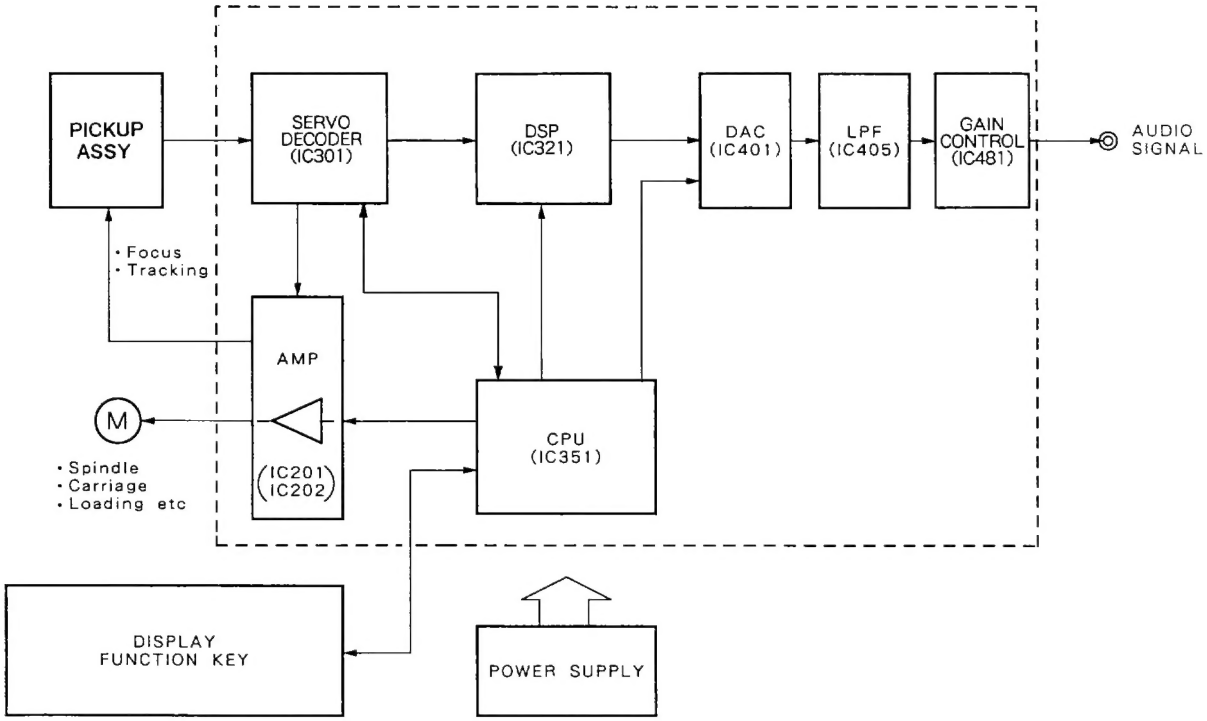
2.2 MULTI MECHANISM ASSY



Parts List

Mark	No.	Description	Part No.
	1	Motor pulley	PNW1634
	2	Gear holder	PNW1929
	3	PU frexible cable	PNP1343
	4	Cam gear	PNW1923
	5	Belt	PEB1138
	6	Top guide N	PNW2441
	7	Gear pulley	PNW1918
	8	Gear S	PNW1919
	9	Gear L	PNW1920
	10	Eject spring	PBH1107
	11	Switch lever	PNW1927
	12	Seven bar	PNW1931
	13	Sub rotary lever	PNW1933
	14	Sub rotary lever spring	PBH1111
	15	Rotary lever	PNW1932
	16	Drive plate	PNW1930
	17	Motor screw	PBA-112
	18	Holder lever spring	PBH1110
	19	Disc holder	PNW1924
	20	Cushion A	PED1001
	21	Holder lever	PNW1925
	22	Float rubber	PEB1014
	23	Float rubber	PEB1132
	24	Float screw	PBA1073
	25	Release lever	PNW1934
	26	Release spring	PBH1106
	27	Clamper cam	PNW1922
	28	Clamper holder	PNW1921
	29	Clamper spring	PBH1109
	30	Clamper	PNW1857
	31	Lock lever	PNW1917
	32	Lock spring	PBH1108
	33	Stair NL	PNW2443
	34	Stair NR	PNW2444
	35	Synchronize lever	PNW1926
	36	Motor assy (LOADING, DISC SELECT)	PEA1130
	37	Screw	PMZ26P040FMC
	38	Screw	PPZ30P080FMC
	39	Screw	BBZ30P060FMC
	40	Washer	WT26D047D025
	41	Washer	WA31D054D025
	42	E ring	Z39-010
	43	Screw	IPZ30P080FMC
	44	Rubber spacer	PEB1238
	45	Rubber spacer	PEB1179
	46	Silent ring	PBK1093
	47	Washer	WA62D130D025
	48	Earth spring	PBH1132
	49	Guide bar	PLA1094
	50	Disc table	PNW1067
	51	Gear 1	PNW2052
	52	Gear 2	PNW2053
	53	Gear 3	PNW2054
	54	Pinion gear	PNW2055
	55	PWB holder	PNW2057
NSP	56	Carriage DC motor / 0.3W	PXM1027
	57	D.C. motor assy (spindle, with oil)	PEA1235
	58	Pickup assy	PEA1291
	59	Disc table assy	PEA1035
	60	Screw	BBZ26P060FMC
	61	Screw	BPZ20P060FMC
	62	Screw	BPZ26P100FMC
	63	Screw	JFZ17P025FZK
	64	Screw	JFZ20P040FMC
	65	Washer	WT12D032D025
	66	Connector assy 4P	PDE1241
	67	Stopper spring	PBH1131
	68	Stopper	PNW2069
	69	D.C. motor assy (CARRIAGE)	PEA1246
	70	Upper chassis	PNB1267
	71	Sub chassis N	PNW2440
	72	Connector assy 4P	PDE1240
NSP	101	Motor	VXM1033
NSP	102	Eject lever	PNB1306
	103	• • • • •	
NSP	104	Servo mechanism assy M	PXA1512
NSP	105	Loading board assy	PWZ2038
	106	• • • • •	
	107	• • • • •	
NSP	108	Main chassis	PNW2074
NSP	109	Select board assy	PWZ2533
NSP	110	Motor board assy	PWZ2040
NSP	111	Mechanism board assy	PWX1192
NSP	112	Earth lead unit	PDF1118
NSP	113	Clamp magnet	PMF1014
NSP	114	Gear stopper	PNB1303
NSP	115	Yoke M	PNB1312
NSP	116	AV angle	PNB1405
	117	Carriage base	PNW2445

3. BLOCK DIAGRAM



4. SCHEMATIC AND PCB CONNECTION DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ← V : DC voltage (V) in PLAY mode unless otherwise noted.
   ⇨ mA or ← mA : DC current in PLAY mode unless otherwise noted. Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   • ⌀ or ❶ : Adjusting point.
   • ◁ : Measurement point.
   • The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH—□ ON THE SCHEMATIC DIAGRAM:**
   • SCH—□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):

FUNCTION BOARD ASSY
S702 : EJECT ▲
S703 : DISC 2
S704 : DISC 1
S705 : AUTO FADER
S706 : MUSIC TYPE
S708 : PROGRAM
S709 : 1
S710 : 2
S711 : 3
S712 : 4
S713 : 5
S714 : 6
S715 : 7
S716 : 8
S717 : 9
S718 : 10
S719 : > 10
S721 : COMPU/TIME FADE
S722 : HI – LITE
S723 : DISC 3
S724 : DISC 4
S725 : ADLC
S726 : DSP MODE
S727 : DISC 5
S728 : DISC 6
S729 : PAUSE
S730 : REPEAT
S731 : STOP ■
S732 : TIME
S733 : PLAY ▶
S734 : RANDOM
S735 : ⏮◀◀
S736 : ▶▶⏭

SWITCH BOARD ASSY
S801 : POWER

IC301 (CXD2515Q)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0.2to0.5	26	3.3	51	0	76	5.0
2	0	27	2.4	52	5.0	77	4.7
3	0.1	28	2.4	53	2.3	78	4.9
4	0.1	29	2.4	54	5.0	79	0
5	0.3	30	2.5	55	2.5	80	4.8
6	0	31	2.6	56	0	81	5.0
7	0.2	32	2.5	57	5.0	82	5.0
8	0	33	2.5	58	4.4	83	5.0
9	0.2	34	2.6	59	0	84	0
10	0.2	35	0	60	0	85	0
11	0.5	36	2.5	61	0	86	4.9
12	5.0	37	2.5	62	2.5	87	5.0
13	0	38	2.5	63	1.5	88	4.9
14	0	39	2.5	64	0	89	0
15	0	40	5.0	65	0	90	5.0
16	0	41	5.0	66	2.7	91	0
17	0	42	5.0	67	2.7	92	0
18	0.1	43	0	68	1.5	93	5.0
19	5.0	44	2.5	69	1.1	94	0
20	0	45	2.5	70	5.0	95	4.9
21	5.0	46	2.4	71	2.4	96	2.6
22	1.5	47	2.0	72	0	97	0
23	0	48	2.5	73	2.5	98	5.0
24	2.4	49	1.9	74	0.1	99	5.0
25	2.4	50	2.5	75	0.1	100	0to0.3

IC351 (PD3270A)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	21	0	41	– 23to – 3	61	0
2	5.0	22	0	42	– 23to – 3	62	0
3	5.0	23	0	43	– 23to – 3	63	0
4	5.0	24	4.9	44	– 23to – 3	64	0
5	0	25	5.0	45	– 23.0	65	0
6	0	26	– 9.3	46	– 23.0	66	5.0
7	0	27	0	47	– 23.0	67	4.9
8	5.0	28	0	48	– 23.0	68	4.7
9	0	29	0	49	– 23.0	69	4.9
10	2.3	30	0	50	– 23.0	70	5.0
11	2.3	31	0	51	– 23.0	71	5.0
12	5.0	32	– 23to – 3	52	– 23.0	72	4.8
13	4.9	33	– 23to – 3	53	– 23.0	73	0
14	0.1	34	– 23to – 3	54	0	74	5.0
15	5.0	35	– 23to – 3	55	0	75	5.0
16	5.0	36	– 23to – 3	56	0	76	5.0
17	0	37	– 23to – 3	57	5.0	77	0
18	0	38	– 23to – 3	58	0	78	0
19	5.0	39	– 23to – 3	59	0	79	0
20	0	40	– 25.9	60	0	80	0

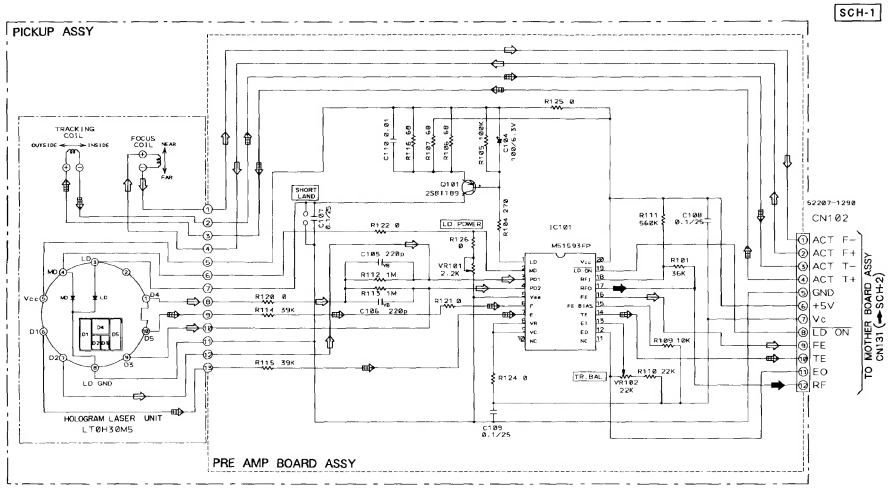
IC401 (PD2026B)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0	8	0	15	5.0	22	4.9
2	0.1	9	2.6	16	0	23	5.0
3	5.0	10	2.4	17	5.0	24	5.0
4	5.0	11	5.0	18	0	25	2.5
5	2.4	12	0	19	2.4	26	2.4
6	2.6	13	2.1	20	5.0	27	2.5
7	0	14	2.1	21	4.9	28	5.0

IC321 (TC9332F)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	16	2.5	31	5.0	46	5.0
2	5.0	17	2.5	32	2.5	47	5.0
3	5.0	18	0	33	2.4	48	4.9
4	5.0	19	2.5	34	0	49	4.9
5	0	20	2.5	35	0	50	4.9
6	5.0	21	2.5	36	5.0	51	4.9
7	5.0	22	2.5	37	0	52	0
8	5.0	23	2.5	38	0	53	5.0
9	5.0	24	2.4	39	5.0	54	5.0
10	5.0	25	0	40	0	55	5.0
11	5.0	26	2.4	41	5.0	56	5.0
12	0	27	2.5	42	5.0	57	5.0
13	5.0	28	0	43	5.0	58	5.0
14	0	29	2.5	44	5.0	59	5.0
15	2.5	30	2.5	45	5.0	60	5.0

1. PICKUP ASSY



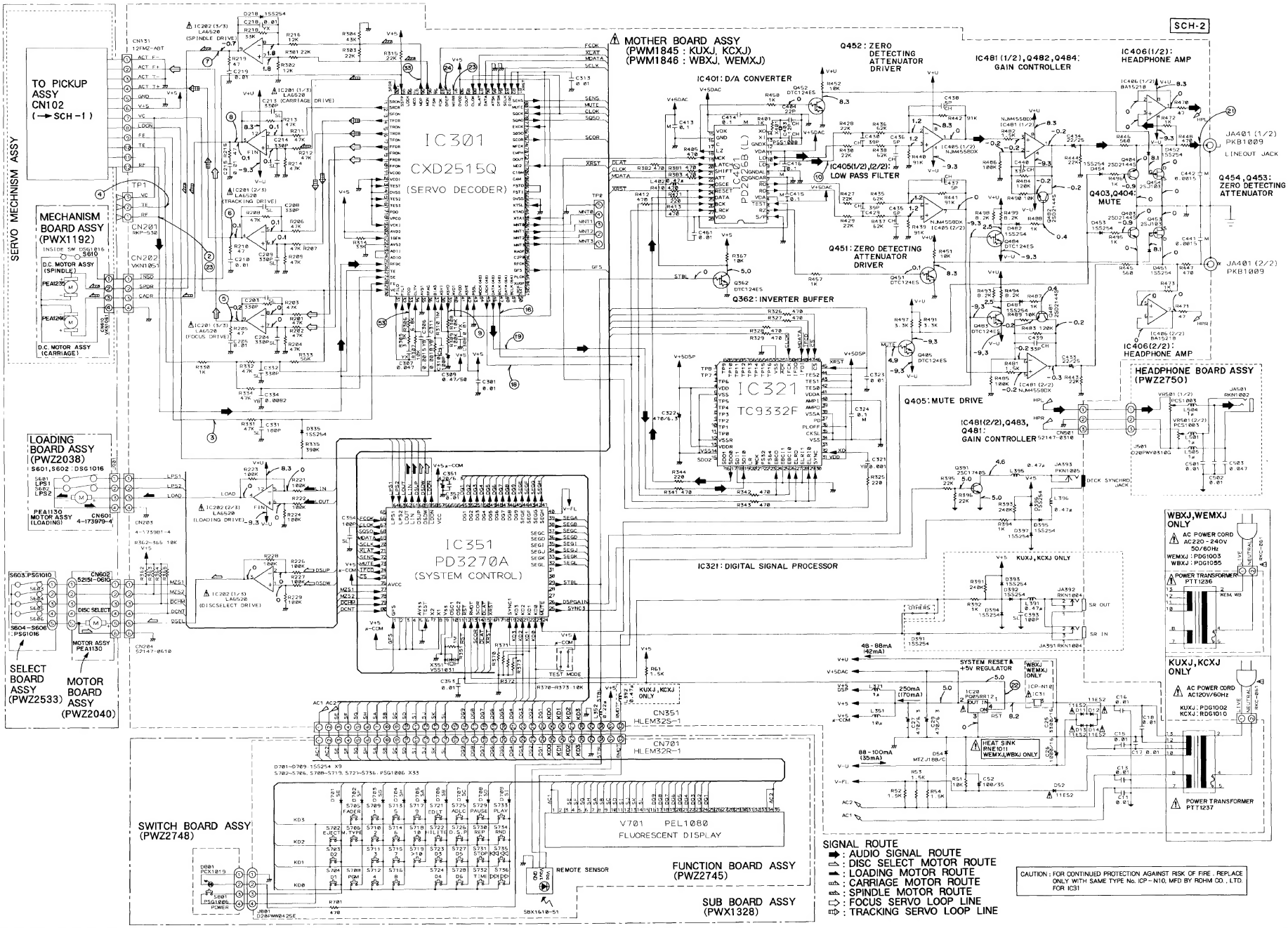
Note : Component parts are not principally supplied and the diagram is basic and may be changed.

SIGNAL ROUTE
➡ : AUDIO SIGNAL ROUTE
⇨ : FOCUS SERVO LOOP LINE
⇨ : TRACKING SERVO LOOP LINE

SCH—1 PICKUP ASSY

PICKUP ASSY SCH—1

2. MOTHER, FUNCTION, SWITCH, HEADPHONE, MECHANISM, LOADING, MOTOR, SELECT BOARD ASSY



• This diagram is viewed from the mounted parts side.

NOTE FOR PCB DIAGRAMS:
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
Q504 (E B C)	Q504 Q504	Transistor
D203	D203	Diode
C513	C513	Capacitor (Polarized)

3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ▽ or ▷ shows cathode side.
5. The capacitor terminal marked with ⊖ or ⊏ shows negative terminal.

⚠ AC POWER CORD
WBXJ, WEMXJ : AC220 – 240V 50/60Hz
KUXJ, KCXJ : AC120V 60Hz

MOTOR BOARD ASSY
DISC SELECT MOTOR
TO MOTHER BOARD ASSY CN204

SELECT BOARD ASSY

MECHANISM BOARD ASSY
SPINDLE MOTOR
CARRIAGE MOTOR

LOADING BOARD ASSY
LOADING MOTOR

SWITCH BOARD ASSY

FUNCTION BOARD ASSY
TO MOTHER BOARD ASSY CN351
PNP1323-D

MOTHER BOARD ASSY
KUXJ, KCXJ ONLY
PRIMARY
TO PICKUP ASSY
TO MOTOR BOARD ASSY CN602
TO FUNCTION BOARD ASSY CN701
KUXJ, KCXJ ONLY
PNP1367-A

Q391 Q404 IC406 Q454 Q403 Q452 Q453 Q451 Q482 Q481 IC481 Q405 Q484 IC201 Q483 IC405 IC20 IC401 IC301 IC321 IC351 IC202 Q362

HEADPHONE BOARD ASSY

NOTE FOR PCB DIAGRAMS:
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
	IN OUT	3-terminal regulator

• This diagram is viewed from the foil side.

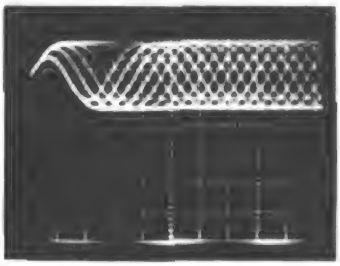
Waveforms

Note: The encircled numbers denote measuring points in the schematic diagram.

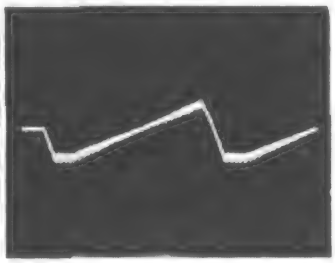
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

*2 FOCUS-IN: Press the key without loading a disc.

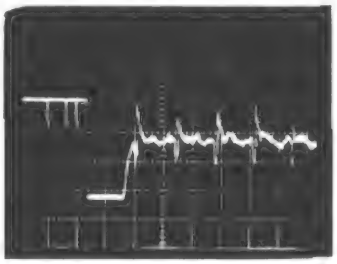
② TP1-Pin 1 :PLAY MODE
(RF)
500mV/div 500nsec/div



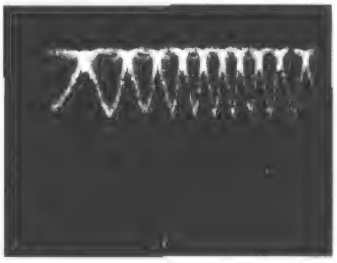
⑤ IC201-Pin 9 :FOCUS-IN (* 2) MODE
(FODR)
1V/div 200ms/div



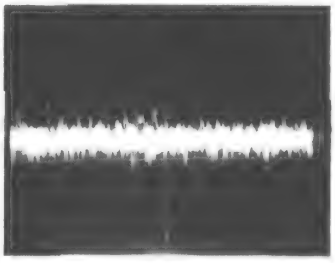
⑦ IC202-Pin 9 :TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



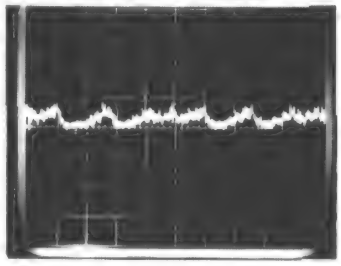
② TP1-Pin 1 :TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div



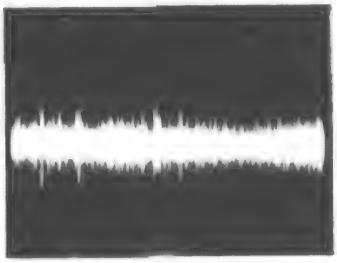
⑤ IC201-Pin 9 :PLAY MODE
(FODR)
1V/div 1msec/div



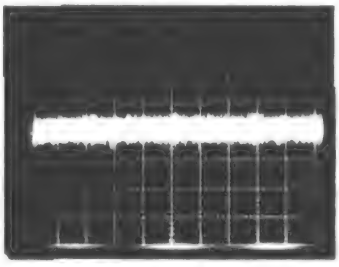
⑧ IC201-Pin 3 :PLAY MODE
(CADR)
500mV/div 5sec/div



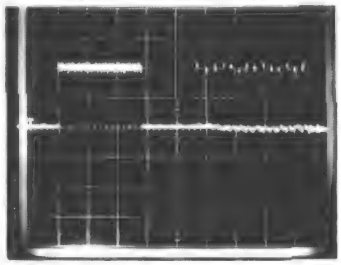
③ FE Side of R331:PLAY MODE
(FOER)
100mV/div 10ms/div



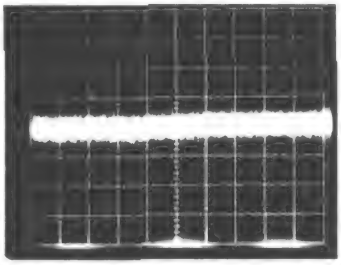
⑥ IC201-Pin 4 :PLAY MODE
(TRDR)
500mV/div 1ms/div



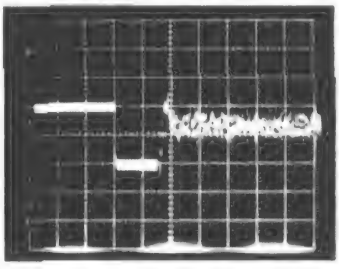
⑧ IC201-Pin 3 :TRACK SEARCH MODE
(CADR)
2V/div 200msec/div



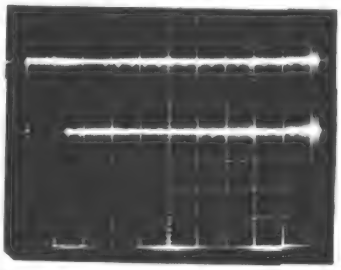
④ TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10ms/div



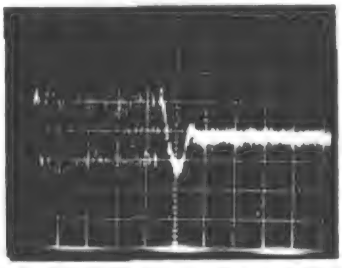
⑥ IC201-Pin 4 :50T-JUMP (* 1)MODE
(TRDR)
500mV/div 1ms/div



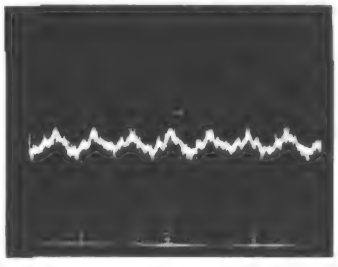
⑨ IC301-Pin 39:PLAY MODE
(EFM)
2V/div 500ns/div



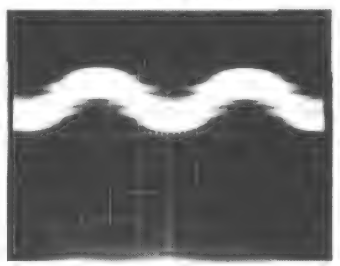
④ TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div



⑦ IC202-Pin 9 :PLAY MODE
(SPDR)
1V/div 50msec/div



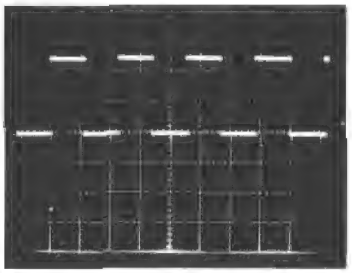
⑩ IC401-Pin 9:PLAY MODE (1kHz)
(LO) (D/A DATA OUT)
2V/div 200 μsec/div



⑯ IC301-Pin 47:PLAY MODE(1kHz)
(BCLK)
2V/div 500nsec/div

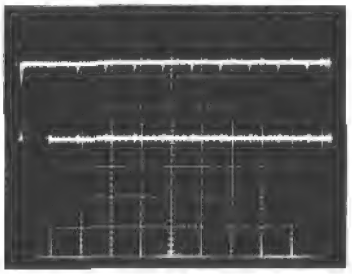
– GND

⑱ IC301-Pin 45:PLAY MODE(1kHz)
(LRCK)
2V/div 10μsec/div



– GND

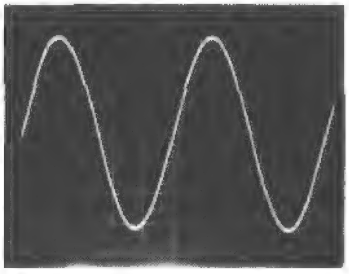
⑲ IC301-Pin 46:PLAY MODE(1kHz)
(DATA)
2V/div 500nsec/div



– GND

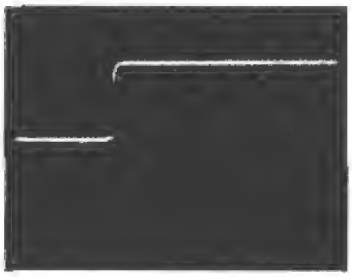
⑳

㉑ Pin -OUTPUT: PLAY MODE (1kHz)
1V/div 200μsec/div



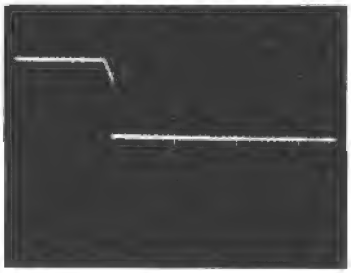
– GND

㉒ IC20-Pin 4:POWER SWITCH-ON
(RST)
2V/div 100msec/div



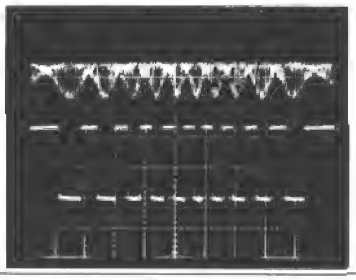
– GND

㉒ IC20-Pin 4:POWER SWITCH-OFF
(RST)
2V/div 100msec/div



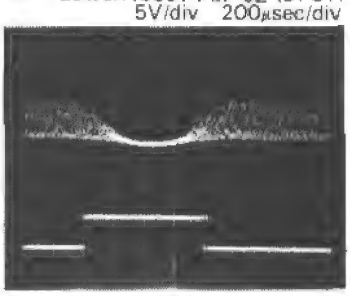
– GND

㉓ : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC301-Pin 91 (MIRR)
2V/div 200μsec/div



(Upper)
– GND
– GND
(Lower)

㉔ : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC301-Pin 92 (DFCT)
5V/div 200μsec/div



(Upper)
– GND
– GND
(Lower)

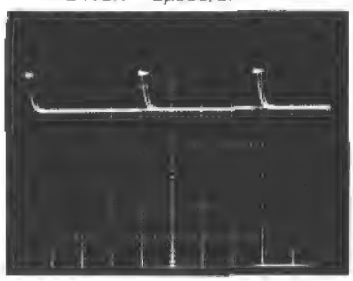
㉕

㉖

㉗

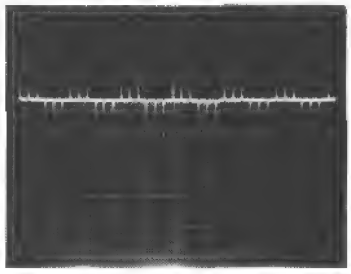
㉘

㉝ IC301-Pin 86:PLAY MODE
(MDP)
2V/div 2μsec/div



– GND

㊸ IC301-Pin 33:PLAY MODE
(PCO)
2V/div 10μsec/div



– GND

5. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ····· RD1/8PM 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
⚠		MOTHER BOARD ASSY	PWM1845
NSP		SUB BOARD ASSY	PWX1328
		├ FUNCTION BOARD ASSY	PWZ2745
NSP		├ SWITCH BOARD ASSY	PWZ2748
NSP		└ HEADPHONE BOARD ASSY	PWZ2750
NSP		MECHANISM BOARD ASSY	PWX1192
NSP		LOADING BOARD ASSY	PWZ2038
NSP		MOTOR BOARD ASSY	PWZ2040
NSP		SELECT BOARD ASSY	PWZ2533
MOTHER BOARD ASSY			
SEMICONDUCTORS			
		IC406	BA15218
		IC301	CXD2515Q
⚠		IC201, IC202	LA6520
		IC405, IC481	NJM4558DX
		IC401	PD2026B
		IC351	PD3270A
⚠		IC20	PQ05RR12
		IC321	TC9332F
		Q391	2SC1740S
		Q403, Q404, Q481, Q482	2SD2144S
		Q453, Q454	2SJ103
		Q362, Q405, Q451, Q452	DTC124ES
		Q483, Q484	DTC124ES
⚠		D11-D14, D52	11ES2
		D218, D335, D391-D397	1SS254
		D451-D454, D481, D482	1SS254
		D54	MTZJ18B
COILS AND FILTERS			
		L371	LAU010K
		L351	LAU100K
		L352	LAUR22K
		L391, L392, L395, L396, L402	LAUR47K

Mark	No.	Description	Part No.
CAPACITORS			
		C435-C438	CCCCH050C50
		C310	CCCCH101J50
		C403	CCCCH120J50
		C404	CCCCH220J50
		C439, C440	CCCCH330J50
		C429, C430	CCCCH390J50
		C354, C393	CCCSL101J50
		C331	CCCSL181J50
		C203, C204, C208, C209	CCCSL331J50
		C213, C214, C332	CCCSL331J50
		C52	CEAS101M35
		C26	CEAS102M16
		C433, C434	CEAS220M25
		C25	CEAS332M16
		C27, C29, C322, C351	CEAS471M6R3
		C309	CEASR47M50
		C218, C308	CGCYX103K25
		C307	CGCYX473K25
		C321	CKCYB102K50
		C306	CKCYB152K50
		C311	CKCYB182K50
		C334	CKCYB822K50
		C11, C13, C15-C18, C205	CKCYF103Z50
		C210, C215, C219, C301, C313	CKCYF103Z50
		C323, C352, C461	CKCYF103Z50
		C353	CQMA103J50
		C324, C413-C416	CQMA104J50
		C441, C442	CQMA152J50
RESISTORS			
		All Resistors	RD1/6PM□□□J
OTHERS			
		CN131 CONNECTOR 12P	12FMZ-ABT
		CN203 CONNECTOR 4P	4-173981-4
		CN501 3P JUMPER CONNECTOR	52147-0310
		CN204 6P JUMPER CONNECTOR	52147-0610
		CN351 CONNECTOR 32P	HLEM32S

Mark	No.	Description	Part No.
		JA401 2P PIN JACK	PKB1009
		JA393 MINI JACK	PKN1005
		X401 CRYSTAL RESONATOR (16.9344MHZ)	PSS1008
⚠		TERMINAL	RKC-061
		JA391, JA392 REMOTE CONTROL JACK	RKN1004
		CN202 CONNECTOR 4P	VKN1051
		X351 CERAMIC RESONATOR	VSS1031

FUNCTION BOARD ASSY

SEMICONDUCTORS

	D701-D709	1SS254

SWITCHES AND RELAYS

	S702-S706, S708-S719	PSG1006
	S721-S736	PSG1006

RESISTORS

	All Resistors	RD1/6PM□□□J

OTHERS

	CN701 CONNECTOR 32P	HLEM32R
	V701 FL INDICATOR TUBE	PEL1080
	REMOTE SENSOR	SBX1610

SWITCH BOARD ASSY

SEMICONDUCTORS

	D801	PCX1019

SWITCHES AND RELAYS

	S801	PSG1006

HEADPHONE BOARD ASSY

COILS AND FILTERS

	L501, L504, L505	LAU010K

CAPACITORS

	C501, C502	CKCYF103Z50
	C503	CKCYF473Z50

RESISTORS

	VR501	PCS1003

OTHERS

	JA501 3P JUMPER WIRE	RKN1002

MECHANISM BOARD ASSY

SWITCHES AND RELAYS

	S610	DSG1016

OTHERS

	CN610	VKN1061

LOADING BOARD ASSY

SWITCHES AND RELAYS

	S601, S602	DSG1016

OTHERS

	CN601 CONNECTOR 4P	4-173979-4

Mark	No.	Description	Part No.

MOTOR BOARD ASSY

OTHERS

	CN602 6P JUMPER CONNECTOR	52151-0610

SELECT BOARD ASSY

SWITCHES AND RELAYS

	S604-S606	DSG1016
	S603	PSG1010

6. ADJUSTMENTS

● Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment Items/Verification Items and Order

If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in steps 1 − 4, the pickup block may be defective.

● Measuring Instruments and Tools

Step	Item	Test Point	Adjustment Location
1	Focus S curve verification		None
2	Tracking error balance verification	TP1, Pin 2 (TRK. ERR)	None
3	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
4	RF level verification	TP1, Pin 1 (RF)	None

Note : The digital servo IC (CXD2515Q) being used in this set has the following functions and does not provide focus offset, focus servo loop gain and tracking servo loop gain adjustments.

1. Average function
   For accurate servo control, VC, FCS. ERR and RF average measurements are performed and the measured values are compensated through a compensation circuit.
   Thus, volume control for FCS. OFS adjustment is not provided.
2. Auto gain control function
   The gain inside the filter is automatically adjusted to obtain a proper gain in the servo loop. This function permits the optimum gain to be obtained on each disc.
   Thus, volume controls for FCS. GAIN and TRK. GAIN adjustments are not provided.
   The gain adjustment is done before TOC reading.

● **Abbreviation table**

FCS. ERR :Focus Error
TRK. ERR :Tracking Error
FCS GAN :Focus Gain
TRK GAN :Tracking Gain
FCS. IN :Focus In
TRK. IN :Tracking In

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Standard tools

● Test Point and Adjustment Variable Resistor Positions

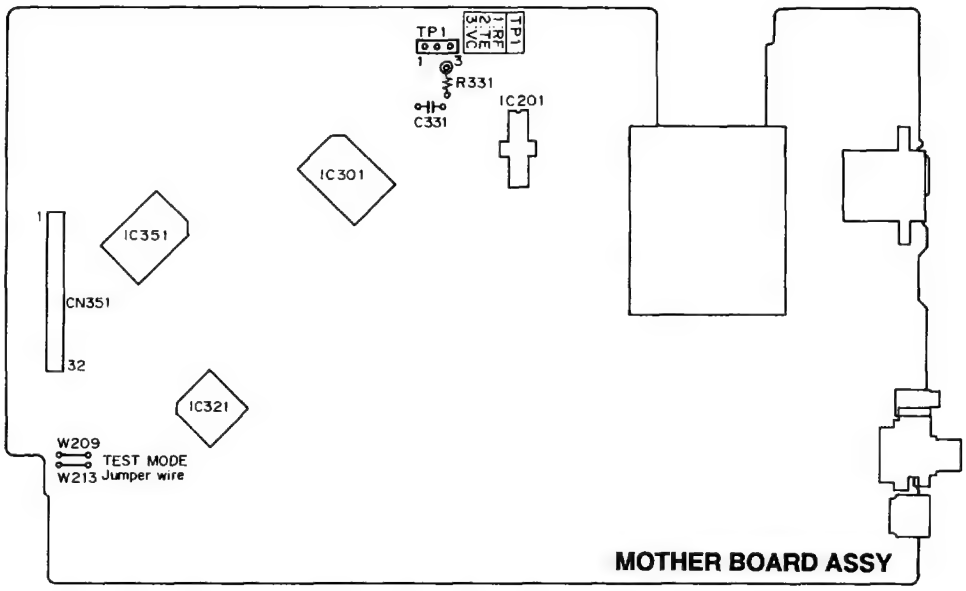


Figure 1 Adjustment Locations

● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

● Test Mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.
1. Unplug the power cord from the AC socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key Name	Function in Test Mode	Explanation
	PGM (PROGRAM)	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised three times and returned to its original position.
▷	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
□□	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.

Code	Key Name	Function in Test Mode	Explanation
⏮⏮	MANUAL/ TRACK SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏭⏭	MANUAL/ TRACK SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
	REPEAT	Auto gain adjustment	• Perform the tracking and focus gain adjustments. • The adjustment is performed when this key is pressed during playback. For a proper adjustment, perform it at the inner periphery of a disc. When the key is pressed in other statuses than playback, be sure to disconnect the AC power cord from the AC socket and perform the necessary settings for test mode again.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
⏏	EJECT	CD magazine eject	Stores Disc 1 in the CD magazine, then ejects the CD magazine. However, even though the CD magazine is ejected, the pickup does not return to the park position. Even if the CD magazine is mounted again, the pickup remains where it is.

Note : • When inserting the CD magazine, disc 1 of the magazine is loaded automatically.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.

PGM(PROGRAM)	Lights up the laser diode and closes the focus servo.
⇩	
PLAY ▷	Starts the spindle motor and closes the spindle servo.
⇩	
PAUSE ▯▯	Closes the tracking servo.
⇩	
REPEAT	Auto gain adjustment.

Wait at least 2–3 seconds between each of these operations.

1. Focus Error Signal (Focus S Curve) Verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the waveform for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to R331 lead wire (marking side) and GND of it to TP1, Pin 3 (VC). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 3 to ground. Short-circuit the both side of C331.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 2 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

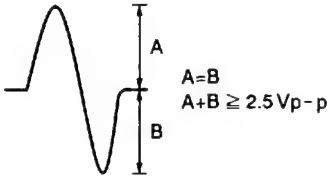


Figure 2

[Judging the pickup]

Do not judge the pickup until all the adjustment have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR101 (laser power) is adjusted , the RF signal can not be brought up to the standard level.

2. Tracking Error Balance Verification

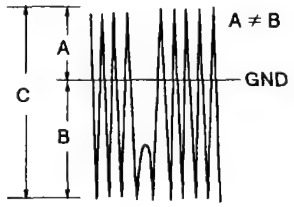
● Objective ● Symptom when out of adjustment	To verify that there is no variation in the sensitivity of the tracking photo diode. Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR) and GND of it to TP1, Pin 3 (VC). (This connection may be via a low pass filter.) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open None YEDS-7

[Procedure]

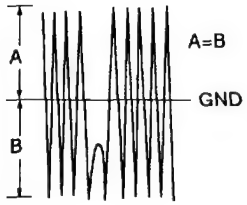
1. Move the pickup to midway across the disc (R=35 mm) with the MANUAL/TRACK SEARCH FWD ▷▷ ▷▷| or REV |◁◁ ◁◁ key.
2. Press the PGM (PROGRAM) key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Supposing that the positive amplitude of the tracking error signal at TP1, pin 2 (TRK ERR) is (A) and the negative amplitude is (B), the following expression is satisfied.

When $A \geqq B$, $\frac{A-B}{C} \times \frac{1}{2} \leqq 0.05$

When $A < B$, $\frac{B-A}{C} \times \frac{1}{2} \leqq 0.05$



When there is a DC component



When there is no DC component

3. Pickup Radial/Tangential Tilt Adjustment

● Objective ● Symptom when out of adjustment	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals. Sound broken;some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF) and GND of it to TP1, Pin 3 (VC). [Settings] 20 mV/division 200 ns/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play Pickup radial tilt adjustment screw and tangential tilt adjustment screw YEDS-7

[Procedure]

1. Press the MANUAL/TRACK SEARCH FWD ▷▷▷▷| or REV |◁◁◁◁ key to move the pickup to halfway across the disc (R=35mm).
   Press the PGM(PROGRAM) key, the PLAY ▷ key, then the PAUSE ▯▯ key in that order to close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 4).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.

Note:Radial and tangential mean the directions relative to the disc shown in Figure 3.

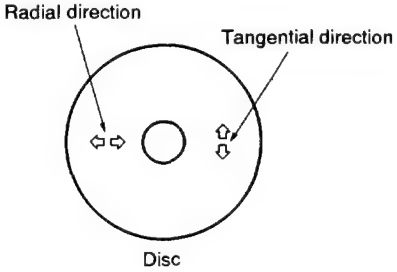
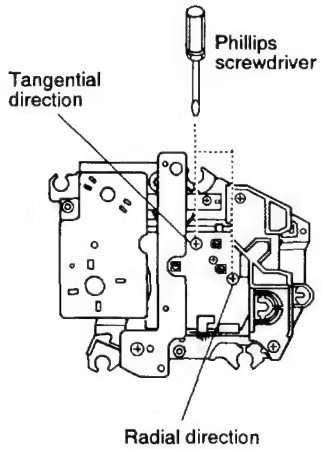


Figure 3



Adjustment locations

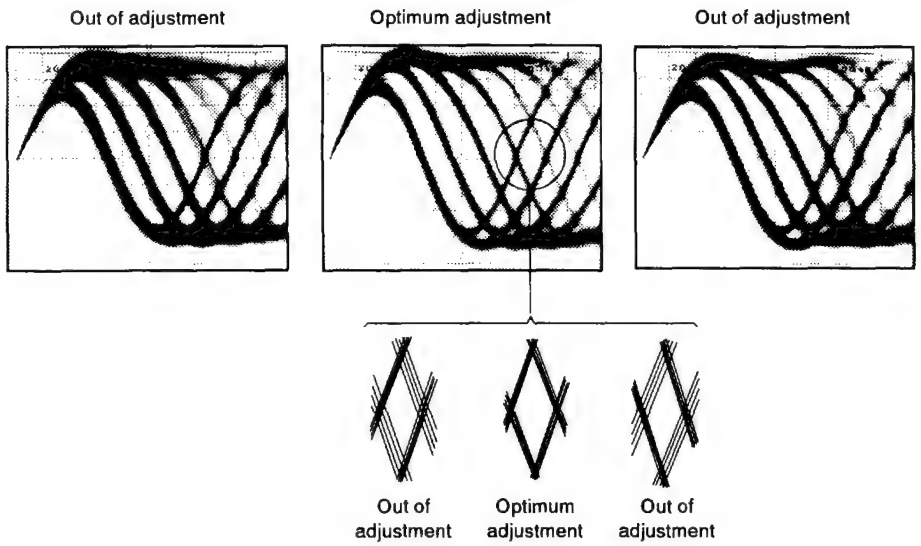


Figure 4 Eye pattern

4. RF Level Verification

● Objective	To verify the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF) and GND of it to TP1, Pin 3(VC). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play None YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35 mm) with the MANUAL/TRACK SEARCH FWD ▷▷/▷▷| or REV |◁◁/◁◁ key, then press the PGM (PROGRAM) key, the PLAY ▷ key, then the PAUSE ▯▯ key in that order to close the respective servos and put the player into play mode.
2. Verify the RF signal amplitude is 1.2 Vp-p ± 0.2 V.

7. IC INFORMATION

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ PD3270A (Mother Board Assy:IC351), CMOS IC FUNCTION: SR Input, System Control, Display Data Serial Transmission

● Pin Functions

Pin No.	Symbol	Name	Function	I/O	Reset	Initial
1	P04	GFS	Frame sync. signal, lock input (H:OK)	I	–	–
2	P05	NC	Vcc	I	+5V	+5V
3	P06					
4	P07					
5	AVss	NC	(A/D converter reference voltage):GND	GND	–	–
6	TEST	NC	(TEST pin for manufacturer):GND	GND	–	–
7	X2	NC	(Subclock oscillator connecting pin):OPEN	–	–	–
8	X1	NC	(Subclock oscillator connecting pin):Vcc	–	+5V	+5V
9	Vss	Vss	GND			
10	OSC1	OSC1	System clock oscillator connecting pin:8 MHz			
11	OSC2	OSC2				
12	¯RES	¯RST	CPU reset (L:Reset)	I	–	–
13	¯IRQ0	RMDT	Remote control data input	I	–	–
14	¯IRQ1	SCOR	Subcode sync., S0+S1 input	I	–	–
15	P12	¯DLAT	DAC control data latch pulse	O	–	H
16	P13	¯XRST	Reset output for LSI	O	–	L
17	P14	NC	NC	O	–	L
18	P15					
19	P16	SYNC1	Sync input	I	–	–
20	P33	KD3	Key data input	I	–	–
21	P32	KD2				
22	P31	KD1				
23	P30	KDO/TEST	Key data input. Test mode request input (H:TEST, L:Normal mode)	I	–	–
24	P47	¯MUTE	Muting output (L:MUTE)	O	–	L
25	P46	SYNC3	Sync output	O	–	L
26	P45	DSPGAIN	DSP analog gain control output	O	–	L
27	P44	NC	NC	O	–	L
28	P43					
29	P42	STBL	Standby LED output (L:Off:, H:Lit), OSCE output	O	–	L
30	P41	NC	NC	O	–	L
31	P40			O	–	L
32	FS15	SEG L	Segment output for FL driving	O	– 26V	– 26V
33	FS14	SEG K				
34	FS13	SEG J				
35	FS12	SEG I				

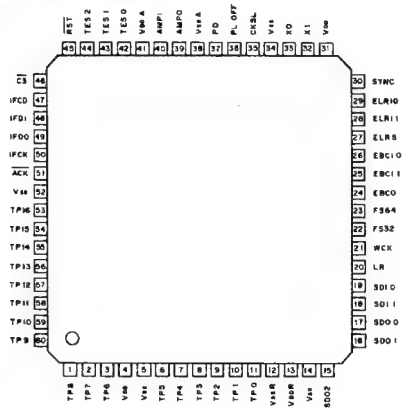
Pin No.	Symbol	Name	Function	I/O	Reset	Initial
36	FS11	SEG D	Segment output for FL driving	O	– 26V	– 26V
37	FS10	SEG C				
38	FS9	SEG B				
39	FS8	SEG A				
40	Vdisp	Vdisp	– 26V	I		
41	FS7	SEG H	Segment output for FL driving	O	– 26V	– 26V
42	FS6	SEG G				
43	FS5	SEG F				
44	FS4	SEG E				
45	FD4	DG9	DIGIT output for FL driving	O	–	⎍
46	FD5	DG8				
47	FD6	DG7				
48	FD7	DG6				
49	FD8	DG5				
50	FD9	DG4				
51	FD10	DG3				
52	FD11	DG2				
53	FD12	DG1				
54	P75	NC	NC	O	–	H
55	P76					
56	P77					
57	Vcc	Vcc	+5V			
58	P80	$\overline{\text{LDON}}$	Laser diode output (L:ON, H:OFF)	O	–	H
59	P81	DSDW	Disc selector output port UP:DSUP=H, DSDW=L DOWN:DSUP=L, DSDW=H	O	–	L
60	P82	DSUP		O	–	L
61	P83	LIN	Disc tray output port Return:LIN=H, LOUT=L Loading:LIN=L, LOUT=H	O	–	L
62	P84	LOUT		O	–	L
63	P85	LPS2	Loading position SW2 (L:Clamp)	I	–	–
64	P86	LPS1	Loading position SW1 (H:HOME)	I	–	–
65	P87	NC	NC	O	–	L
66	P90	FCOK	Focus OK input (H:OK)	I	–	–
67	SCK1	CLOK	LSI/DAC serial clock	O	–	H
68	SI1	SQSO	Subcode Q data serial input	I	–	–
69	SO1	MDATA	LSI/DAC control data serial output	O	–	H
70	P94	SCLK	SENS serial data reading clock output	O	–	H

Pin No.	Symbol	Name	Function	I/O	Reset	Initial
71	P95	¯XLAT	LSI control data latch pulse	O	–	H
72	P96	SENS	LSI operation multiple mode input	I	–	–
73	P97	MUTE	Muting output (H:MUTE)	O	–	H
74	PA0	¯IFCD	DSP command/data discrimination output	O	–	H
75	PA1	¯CS	DSP chip select output	O	–	H
76	AVcc	AVcc	+5V	+5V		
77	P00	MZS1	Magazine 1 discrimination input (L:IN, H:OUT)	I	–	–
78	P01	MZS2	Magazine 2 discrimination input (L:6, H:Single)	I	–	–
79	P02	¯DCHM	Disc selector home SW (L:HOME)	I	–	–
80	P03	DCNT	Disc count pulse input	I	–	–

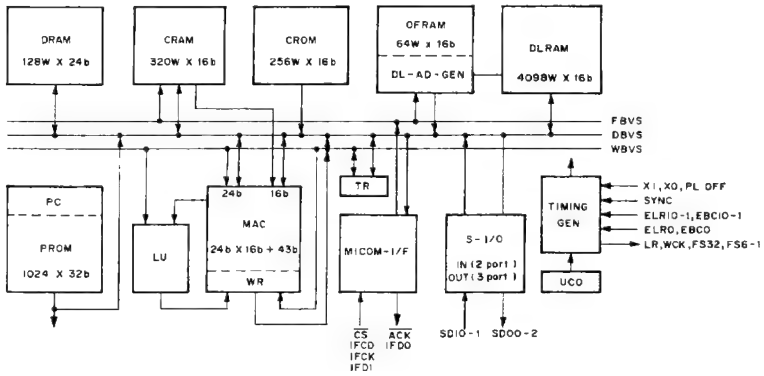
Remarks; H: High Level, L: Low Level, – : High IMP

■ TC9332F (Mother Board Assy : IC321), CMOS IC Digital Signal Processor

● Pin Arrangement (Top view)



● Block Diagram



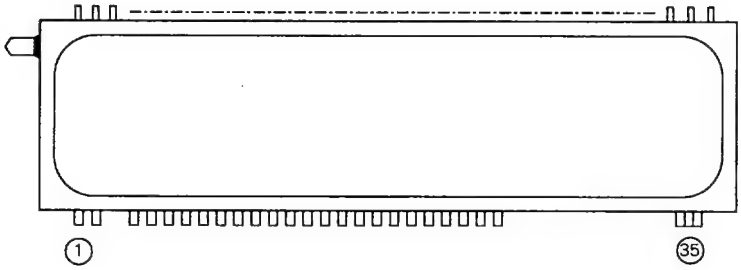
● Pin Functions

Pin No.	Symbol	I/O	Function	Remarks
1 to 3	TP8 to TP6	O	Test data output pin. Normally used opened.	–
4	VDD	–	Power supply pin.	–
5	VSS	–	Ground pin.	–
6 to 11	TP5 to TP0	O	Test data output pin. Normally used opened.	–
12	VSSR	–	Internal delay RAM (DLRAM) ground pin.	–
13	VDDR	–	Internal delay RAM (DLRAM) power supply pin.	–
14	VSS	–	Ground pin.	–
15	SD02	O	Serial data output pin. Either the 24-bit or 16-bit output data can be selected using microprocessor control.	–
16	SD01			
17	SD00			
18	SDI1	I	Serial data input pin. Either the 24-bit or 16-bit input data can be selected using microprocessor control.	–
19	SDI0			
20	LR	O	LR clock output pin. (1 fs)	–

Pin No.	Symbol	I/O	Function		Remarks
21	WCK	O	Word clock output pin. (2 fs)		–
22	FS32	O	Bit clock output pin. (32 fs)		–
23	FS64	O	Bit clock output pin. (64 fs)		–
24	EBC0	I	Bit clock input pin. Inputs the SDO0/1/2 data output shift clock.		Schmitt input
25	EBCI1	I	Bit clock input pin. Inputs the SDI0/1 data input shift clock.	For SDI1 data input	Schmitt input
26	EBCI0			For SDI0 data input	
27	ELRO	I	LR clock input pin. Inputs the SDO0/1/2 data output LR clock.		Schmitt input
28	ELRI1	I	LR clock input pin. Inputs the SDI0/1 data input LR clock.	For SDI1 data input	Schmitt input
29	ELRI0			For SDI0 data input	
30	SYNC	I	Sync signal input pin. Forces the program counter to "0" with the edge of the SYNC signal. The polarity is set by microprocessor control.		Schmitt input
31	VDD	–	Power supply pin.		–
32	XI	I	Crystal oscillator connecting pin/external clock input pin.		–
33	X0	O	Crystal oscillator connecting pin.		–
34	VSS	–	Ground pin.		–
35	CKSL	I	Oscillation clock selection pin. 384 fs clock at "L" 512 fs clock at "H"		With pull-up resistor Schmitt input
36	PLOFF	I	Crystal oscillation mode/VCO oscillation mode selection pin. Built – in VCO oscillation mode at "L". Crystal oscillation mode at "H".		With pull-down resistor
37	PD	O	Phase comparison data output pin.		3-state output
38	VSSA	–	Analog ground pin.		–
39	AMPO	O	LPF amplifier output pin.		–
40	AMPI	I	LPF amplifier input pin.		–
41	VDDA	–	Analog power supply pin.		–
42 to 44	TES0 to TES2	I	Test pin. Normally "H" or used opened.		With pull-up resistor Schmitt input
45	$\overline{RST}$	I	Reset signal input pin.		Pull-up resistor
46	$\overline{CS}$	I	Chip select signal input pin. When $\overline{CS}$ is active during "L", data can be transmitted from the microprocessor.		Schmitt input
47	IFCD	I	Selects commands or data input mode from the microprocessor. Defines commands in the "H" period and data in the "L" period.		Schmitt input
48	IFDI	I	Microprocessor data input pin. Receives commands and data in LSB first.		Schmitt input
49	IFDO	O	Data bus (DBUS) data output pin. Transmits data bus data to the microprocessor in LSB first.		pen drain output With pull-up resistor
50	IFCK	I	Microprocessor data shift clock input pin.		Schmitt input
51	$\overline{ACK}$	O	Microprocessor acknowledge signal output pin. Outputs the acknowledge signal when the parity of the command or data is OK.		Open drain output With pull-up resistor
52	VSS	–	Ground pin.		–
53 to 60	TP16 to TP9	O	Test data output pin. Normally, used opened.		–

● FL INFORMATION

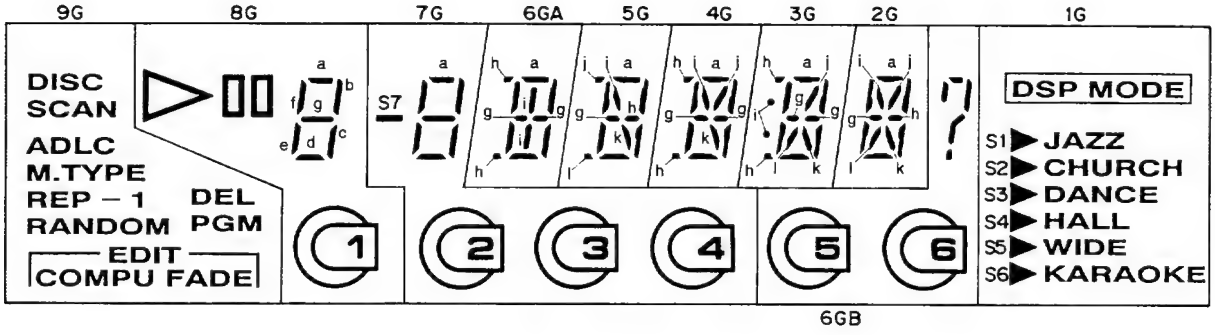
■ PEL1080 (V701)



PIN CONNECTION

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
ELECTRODE	F1	F1	NP	P (e)	P (f)	P (g)	P (h)	P (a)	P (b)	P (c)	P (d)	P (i)	P (j)	P (k)	P (l)	NC	9G	8G		
TERMINAL NO.				19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ELECTRODE				7G	6G	5G	4G	3G	2G	1G	NP	NP	NP	NP	NP	NP	NP	NP	F2	F2

Notes F: Filament NP: No Pin
G: Grid NC: No Connection
P: Anode



8. FOR KCXJ, WEMXJ AND WBXJ TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

KCXJ, WEMXJ, WBXJ and KUXJ types have the same construction except for the following:

Mark	Symbol & Description	Part No.				Remarks
		KUXJ type	KCXJ type	WEMXJ type	WBXJ type	
⚠	Mother board assy	PWM1845	PWM1845	PWM1846	PWM1846	
⚠	Strain relief	CM – 22C	CM – 22	CM – 22B	CM – 22B	
⚠	Power transformer (AC120V)	PTT1237	PTT1237	Not used	Not used	
⚠	Power transformer (AC220 – 240V)	Not used	Not used	PTT1236	PTT1236	
⚠	Power cord with plug	PDG1002	RDG1010	PDG1003	PDG1055	
	Display window	PAM1641	PAM1641	PAM1647	PAM1647	
	Rear base	PNA2118	PNA2112	PNA2117	PNA2121	
	Caution label	Not used	Not used	VRW1094	PRW1018	
	Caution label (G)	Not used	Not used	VRW – 329	VRW – 329	
	Caution label HE	Not used	Not used	PRW1233	Not used	
	65 label	ORW1069	Not used	Not used	Not used	
	Connection cord with mini plug	PDE – 319	PDE – 319	Not used	Not used	
	Magazine assy	PXA1504	PXA1504	PXA1523	PXA1523	
	Operating instructions (English)	PRB1209	Not used	Not used	PRB1209	
	Operating instructions (English/French)	Not used	PRE1198	Not used	Not used	
	Operating instructions (English/French/German/Italian/ Dutch/Swedish/Spanish/Portuguese)	Not used	Not used	PRE1193	Not used	
	CD packing case	PHG2033	PHG2030	PHG2031	PHG2036	
	PP case	PYY1169	PYY1169	Not used	Not used	
	Mirror mat sheet	.....	.....	Z23 – 032	Z23 – 032	
	Bag (For power cord with plug)	Not used	Not used	Not used	Z21 – 013	
NSP	Spacer	Not used	Not used	Not used	PHC1075	See page 4

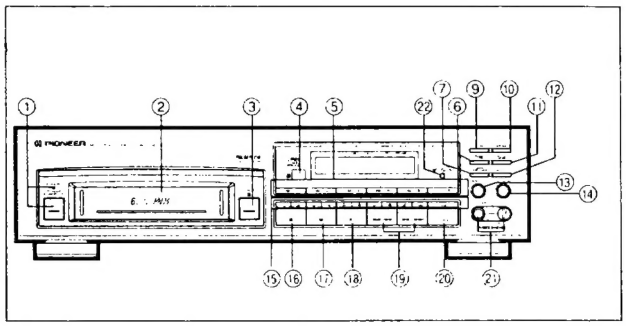
MOTHER BOARD ASSY

PWM1846 and PWM1845 have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		PWM1845	PWM1846	
	D391 – D394	1SS254	Not used	
	L391, L392	LAUR47K	Not used	
	C393	CCCSL101J50	Not used	
	R391	RD1/6PM244J	Not used	
	R392	RD1/6PM102J	Not used	
	JA391, JA392 REMOTE CONTROL JACK	RKN1004	Not used	
	IC31	Not used	ICP – N10	

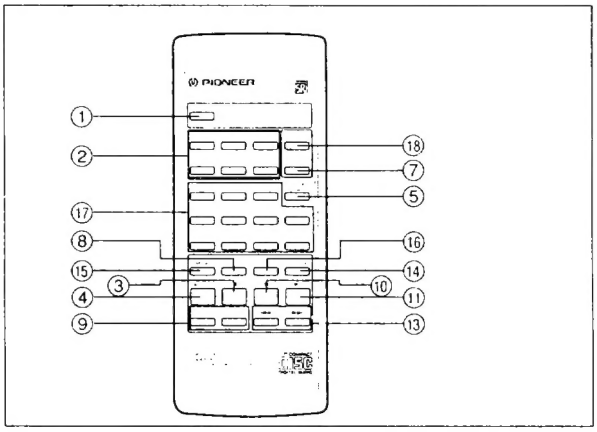
9. PANEL FACILITIES

FRONT PANEL



① POWER STANDBY/ON switch and STANDBY indicator
② Magazine insertion slot
③ EJECT button (⏏)
④ Remote sensor
Receives the signal from the remote control unit.
⑤ Disc number buttons (DISC 1~DISC 6)
⑥ MUSIC TYPE button
⑦ COMPU/TIME FADE button
⑨ TIME button
⑩ REPEAT button
⑪ AUTO FADER button
⑫ ADLC (Automatic Digital Level Controller) button
⑬ RANDOM play button
⑭ HI-LITE scan button
⑮ Digit buttons (1~10, >10)
⑯ Stop button (■)
⑰ Pause button (II)
⑱ Play button (►)
⑲ Track/Manual search buttons (I◄◄ ◄◄/►► ►►I)
⑳ PROGRAM button
㉑ Headphones jack (PHONES) and headphones volume control (PHONES LEVEL)
㉒ DSP MODE button

REMOTE CONTROL UNIT



Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

① POWER button
② DISC NUMBER buttons (1~6)
③ STOP button (■)
④ RANDOM PLAY button
⑤ HI-LITE SCAN button
⑥ FADER button (PD-M603 only)
⑦ ADLC (Automatic Digital Level Controller) button
⑧ CHECK button
⑨ OUTPUT LEVEL buttons (+/–)
⑩ PAUSE button (II)
⑪ PLAY button (►)
⑬ TRACK search buttons (I◄◄/►►I)
⑭ DELETE button
⑮ PGM (program) button
⑯ CLEAR button
⑰ Track number/Digit buttons (1~10, >10)
⑱ DSP mode button

10. SPECIFICATIONS

General

Type ..... Compact disc digital audio system
Power requirements ..... AC 120 V, 60 Hz
Power consumption ..... 12 W
Operating temperature ..... +5°C~+35°C (+41°F~+95°F)
Weight ..... 3.8 kg (8 lb, 6 oz)
External dimensions ..... 420 (W) x 299 (D) x 105 (H) mm

Audio section

Frequency response ..... 2 Hz-20 kHz
S/N ratio
PD-M703 ..... 102 dB or more (EIAJ)
PD-M603 ..... 98 dB or more (EIAJ)
Dynamic range ..... 96 dB or more (EIAJ)
Harmonic distortion ..... 0.003% or less (EIAJ)
Output voltage ..... 2.0 V
Wow and flutter ..... Limit of measurement (±0.001% W. PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)

Output terminal

Audio line output
Headphone jack with volume control
Control input/output jacks
CD-DECK SYNCHRO jack

Accessories

- Remote control unit 1
- AAA/R03 dry cell batteries 2
- 6-compact-disc magazine 1
- Control cable 1
- Output cable 1
- Operating instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

The Magazine Type Multi-Play CD Players with mark and the Magazines with the same mark are compatible for 12 cm discs.

PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
RRV1646

MULTI-PLAY COMPACT DISC PLAYER

PD-M703

- **Refer to the service manual RRV1072 for PD-M703/WEMXJ and WBXJ.**

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	PD-M703		
WEMXJ8	O	AC220–240V	
WBXJ8	O	AC220–240V	

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE, INC. P.O. Box 1760, Long Beach, CA 90801-1760, U. S. A.
PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 501 Orchard Road, #10-00 Lane Crawford Place, Singapore 0923

T-SZE JUNE 1996 Printed in Japan

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

■ FOR PD-M703/WEMXJ8

● Contrast of PD-M703/WEMXJ8 and PD-M703/WEMXJ

PD-M703/WEMXJ8 and PD-M703/WEMXJ have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		PD-M703/WEMXJ	PD-M703/WEMXJ8	
NSP	CE Mark Label	Not used	RRW1221	

■ FOR PD-M703/WBXJ8

● Contrast of PD-M703/WBXJ8 and PD-M703/WBXJ

PD-M703/WBXJ8 and PD-M703/WBXJ have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		PD-M703/WBXJ	PD-M703/WBXJ8	
NSP	CE Mark Label	Not used	RRW1221	
NSP	BEAB Aproved Label	RRW1003	Not used	